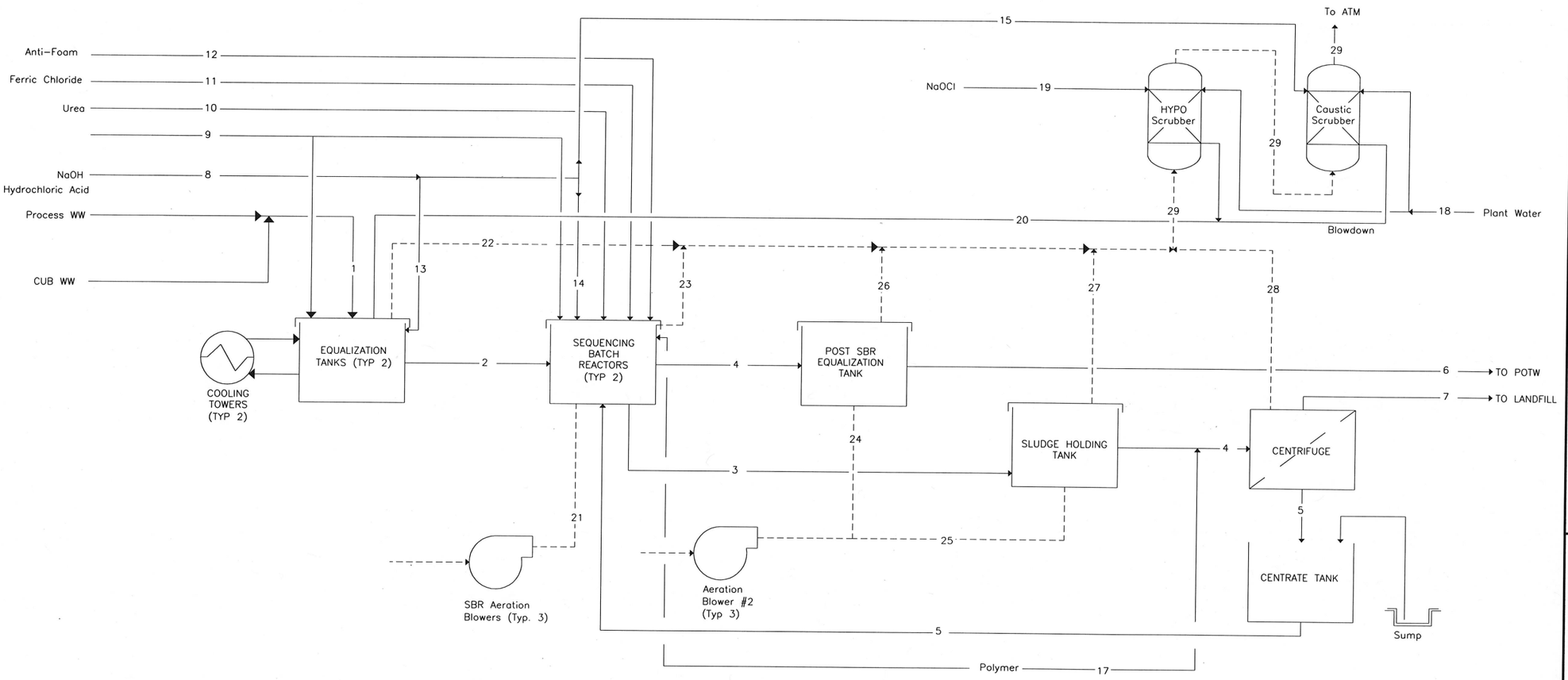

Liquid Stream	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Air Stream	21	22	23	24	25	26	27	28	29
	Influent WW	SBR Feed (1)	WAS	Centrifuge Feed (4)	Centrate (4)	Treated Effluent	Waste Solids (4)	Total NaOH	Total HCl Acid	Urea (N) Nutrient (5)	SBR FeCl3 Feed	SBR Anti-Foam	EQ NaOH Addition	SBR NaOH Addition	Odor Control NaOH	Centrifuge (Dilute) Polymer	SBR (Dilute) Polymer	Odor Control Water Make-Up	Odor Control NaOCl	Odor Control Blowdown		SBR Aeration	EQ Off-Gas Flow	SBR Off-Gas Flow	Post SBR EQ Aeration	Sludge Holding Aeration	Post SBR EQ Off-Gas Flow	Sludge Holding Off-Gas Flow	Centrifuge Air (6)	Total Odor Control Flow
Design Conditions				5 d/wk	5 d/wk		5 d/wk																							
Flow (gpd)	264,720	264,720	29,266	40,972	38,810	263,175	2,162	48	405	4.3	260	571	0	0	48	1,049	-----	-----	165	165	Flowrate (scfm)	2,992	1,273	4,410	401	201	1,013	540	720	7,983
Flowrate (gpm)	500	184	482	80	76	183																								
COD (mg/L)	2,383	2,383																												
COD (lb/d)	5,260	5,260																												
BOD (mg/L)	1,636	1,636				150																								
BOD (lb/d)	3,612	3,612				329																								
TSS (mg/L)	54	54	10,000	10,000	528	150	180,000																							
TSS (lb/d)	119	119	2,441	3,417	171	329	3,246																							
TKN (mg/L) (5)	77	77				100																								
TKN (lb/d) (5)	171	171				219																								
Organic N (mg/L)	77	77				75																								
Organic N (lb/d)	170	170				165																								
Ammonia N (mg/L)	0	0				25																								
Ammonia N (lb/d)	0	0				55																								
TP (mg/L)	90	90				15																								
TP (lb/d)	199	199				33																								
Sulfate (mg/L)	188	188				190																								
Sulfate (lb/d)	416	416				416																								
TDS (mg/L)	4,725	6,052				7,988																								
TDS (lb/d)	10,431	13,361				13,927			1,368		566									1,562										

NOTES

1. ASSUMES ETHANOL DISCHARGE AT 3L/MIN.
2. ASSUME 90% BIOLOGICAL UPTAKE OF 100 BOD5:5N:1P AND TKN FROM HEPES IS BIOAVAILABLE.
3. ASSUME 2 CYCLES PER DAY PER SBR AT 1 HOUR DECANT DURATION.
4. ASSUME CENTRIFUGE OPERATES 1 SHIFT PER DAY, 5 day/wk AT 80 gpm WITH 1% TS CENTRIFUGE FEED AND 90% CAPTURE. CAKE IS ASSUMED 18% TS.
5. TKN IN SBR ASSUMES HEPES TKN IS MADE BIOAVAILABLE. IF NOT BIOAVAILABLE, THEN 40% UREA ADDITION IS 76 gpd.
6. ESTIMATE INCLUDED ROLL OFF AREA AND MISCELLANEOUS MAKEUP AIR.

Approved by

COMMONWEALTH OF MASSACHUSETTS PETER J. GOLDING 37178 REGISTERED PROFESSIONAL ENGINEER

rev	date	description	lead client
B	7/17/07	FOR MA DEP PERMIT APPLICATION	
A	5/30/07	FOR HAZOP REVIEW	LEAD CLIENT

O'BRIEN & GERE ENGINEERS, INC.
5000 Brittonfield Parkway
P.O. BOX 4873
Syracuse, New York 13221
315-437-6100
Fax 315-463-7554
www.obg.com

Bristol-Myers Squibb Company

PROCESS & INSTRUMENTATION DIAGRAMS
MASS
BALANCE
LARGE SCALE CELL CULTURE
148 - WASTEWATER

LSCC FACILITY - DEVENS
MASSACHUSETTS - USA

CAM#	CZA1108002002
SHEET #:	1 of 1
DATE:	5/8/07
SCALE:	NONE
VENDOR DOCUMENT #	
PRJ MGR:	JSR
DESIGNER:	XXX
148-885-PFD-001	
VENDOR NAME:	O'BRIEN & GERE
AUTHOR:	
DISCIPLINE:	PROCESS FLOW DIAGRAM
SYSTEM:	WASTEWATER
SYSTEM #:	980
EQUIPMENT:	
	DRAWING
FACILITY RECORDS	IN PROGRESS
Laser Jet LV.ctb	
2874 40795	

PRELIMINARY
NOT FOR
CONSTRUCTION
DATE: 7/17/07

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

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